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ABSTRACT

A total of 141 children, aged 6 to 10 years, were read eight illustrated attribution problems involving play and non-play behaviors and were asked to infer information concerning the story character's intrinsic or extrinsic motivation for the behaviors. Children were grouped into three age levels (mean ages 5.9, 8.8 and 10.3 years) for analysis of developmental effects. In each age group, half the children were given information about the story character's intrinsic motivation and were asked to infer extrinsic motivation, and half were given the reverse. The intensity of the depicted behaviors was also varied. It was hypothesized that, contrary to the overjustification hypothesis in attribution theory, young children would perceive that extrinsic rewards add to, rather than undermine, the contribution of intrinsic motivation in play behavior, and that this effect would be a simple additive function. Results confirmed the hypothesis: when the story character was given a reward, 6-year-olds inferred greater intrinsic motivation whereas 10-year-olds inferred less intrinsic motivation. A similar pattern occurred in the reverse condition. Attribution of the non-play behaviors did not change with age. Functional measurement analysis revealed that simple addition and subtraction operations characterized the children's judgments. (Author/SS)

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Perceived additivity of intrinsic and extrinsic motivation in young children

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Abstract

It was hypothesized that, contrary to the overjustification hypothesis, when playing is observed in the presence of extrinsic rewards young children exaggerate, instead of discount, the contribution of intrinsic motivation. Five to twelve year olds made attributions for a variety of behavioral events, including play behavior. Children judged the likelihood of a cause from the intensity of the behavior and the state of another plausible cause. The results demonstrated that children in the early elementary grades perceive that extrinsic rewards add to, rather than subtract from, the intrinsic value of an activity even though they use discounting in other behavioral situations.

Perceived additivity of intrinsic and extrinsic motivation in young children: refutation of the "overjustification" hypothesis

Recent research in human motivation shows that when people are rewarded for engaging in an activity which they intrinsically enjoy, the reward often has the paradoxical effect of decreasing, rather then increasing, their subsequent interest in the activity. The most prevalent explanation of this "decreased play effect", known as the overjustification hypothesis, has been stated in terms of self-perception and attribution theory. According to self-perception theory a person's true intrinsic motivation for an activity is a consequence of his perceived intrinsic motivation for that activity (Deci, 1975). Therefore, the attributional analysis focuses on the possible causes that a person might evoke to explain his own behavior.

It is presumed that people believe that either intrinsic interest in playing or reward for playing is alone sufficient reason for engaging in play behavior. The belief that any one of several causes is sufficient to produce an effect is known in the literature as the multiple sufficient causal scheme (Kelley, 1972). According to this causal scheme, if the person observes himself playing when reward is absent, he will attribute his playing to the presence of intrinsic motivation and consequently will be intrinsically motivated. If, however, the person observes himself playing when reward for playing is present, he will attribute his behavior to the reward and discount, or be less certain of, his intrinsic motivation for playing. Discounting of one's intrinsic motivation in turn decreased one's true intrinsic desire to engage in further play.

In spite of the wide acceptance of the attributional explanation, there is no evidence that directly demonstrates a link between causal attributions

and subsequent intrinsic motivation. The only relevant study, desinged by Kruglanski, Alon, and Lewis (1972) to show the attribution - intrinsic motivation linkage, proved to be meaningless because the dependent measure used for causal attribution, namely self-report of liking for the activity, was also the only measure used to assess true intrinsic motivation.

At the same time, indirect evidence is accumulating in the developmental literature which suggests that the attributional interpretation is invalid. Several studies have found (Smith, 1975; Shultz, Butkowsky, Pearce, & Shanfield, 1975; Kun, 1977) that preschoolers, in whom the "decreased play effect" has been repeatedly demonstrated, do not possess the multiple sufficient scheme on which the attributional explanation is predicated. These studies show that the tendency to rule out, or discount, alternate causes for a behavior once a sufficient explanation has been found emerges only during the middle-elementary grades. In defense of attribution theory, however, researchers have tended to discount this infirming developmental evidence. Their argument has been that the young child's failure to use discounting in the causal scheme studies reflects not the inability of the child but the weakness of the methodology to evoke systematic information processing from the child.

However, in the causal explanation of kindness (Baldwin & Baldwin, 1970; Butzin, 1977), play behavior (Karniol & Ross, 1976), and achievement behavior (Kun, 1977) it has been repeatedly observed that prior to the emergence of discounting, kindergartners' judgments are not random but instead obey a qualitatively different rule which we shall call the augmentation principle. Namely, these children believe that the presence of a sufficient cause for a behavior increases the likelihood that other causes were also present. With regard to the intrinsic motivation problem, Karniol & Ross (1976) found that kindergartners inferred that a person who played for a reward liked the

activity more than one who played without reward. Such an inference pattern poses a serious problem for self-perception theory because it implies that if attributions mediated the effect of reward on intrinsic motivation then we should find that for young children rewards enhance, rather than undermine, intrinsic motivation.

The present research was undertaken to extend Karniol & Ross's provocative findings. In their study children inferred which of two actors really liked (or wanted) to play with a toy, the one who got rewarded or the one who didn't. It is possible that the young children's attribution of greater liking to the rewarded than to the non-rewarded person may have reflected judgments of total liking for the immediate stimulus situation where the reward was present. To dissociate judgments of intrinsic task-enjoyment from enjoyment of the total immediate situation, in the present research children judged whether the play activity had been a "favorite" of the actor. The activity chosen for attribution of intrinsic motivation concerned children drawing with colored pens, the activity commonly employed to demonstrate the "decreased play effect" in young children (Lepper, Greene, & Nisbett, 1973; Anderson, Manoogian, & Reznick, 1976).

Karniol and Ross further contended that young children's use of an augmentation rule was equivalent to a simple additive operation where the unknown cause was estimated by adding the known cause to the observed behavior. However, unless one systematically varies the subjective values of two stimulus factors, the unknown cause and the intensity of the behavior, one cannot determine whether the augmentation rule is a result of adding, multiplying, or performing some other combinatorial operation where the judgment is an increasing function of each of the variables (see Anderson, 1974). In order to test the hypothesis that young children's augmentation rule is a simple additive integ-

ration operation, the presence/absence of reward was factorially crossed with the intensity of the behavior and functional measurment techniques were used to analyze the integration function. Finally, the cross-situational generality of an early augmentation rule was explored by including, in addition to the play theme, a wide array of familiar behavioral events not involving play.

The subjects consisted of 141 children who were drawn from kindergarten through grade six of an elementary school located in a white middle-class neighborhood of Santa Barbara. For purposes of analysis the subjects were grouped into three developmental levels: 60 children from kindergarten through second grade, whose mean age was 5.95 years (SD=1.70 yrs); 36 children from third and fourth grades, whose mean age was 8.78 years (SD=0.68 yrs); 45 children from fifth and sixth grades, whose mean age was 10.31 years (SD=2.90 yrs). Boys and girls were approximately evenly assigned to stimulus conditions.

All children were individually tested by one of five experimenters. The experimenter read to each child eight attribution problems dealing with two different behavioral events and used pictures to illustrate the behavior in question. For example, one subject received four problems where the behavioral theme was playing and a second set of four problems where the behavioral theme was eating. Each problem specified whether the intensity of the behavior was mild or extreme and whether one plausible cause for the behavior was present or absent. Behavioral intensity was pictorially as well as verbally indicated. In one problem, for instance, the subject was told that Johnny played with pens for a short time (or a long time) and that Johnny's father promised him (or did not promise him) a surprise for playing with the pens. After the problem was read, the child answered with a Yes or No whether a second cause was present (e.g. Was drawing one of Johnny's favorite games?) and used a nine-point scale to show how sure he or she felt about the answer. Six behavioral themes

(drawing, eating, helping, sharing, fighting, and stealing) were evenly assigned in sets of two to subjects within an age group. Half the subjects received problems where the known cause was internal and the inferred cause was external to the actor and half the subjects received the complementary configuration.

Figure 1 shows children's attributional patterns for play versus non-play behaviors. Most important for our discussion is the qualitative change that

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Insert Figure 1 about here

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occurs between six and ten years of age in the attribution of play behavior. The figure shows that six year olds inferred a positive correlation between two sufficient causes of play behavior whereas ten year olds inferred a negative correlation. That is, our youngest subjects attributed more intrinsic motivation, while our oldest subjects attributed less intrinsic motivation, when play occurred in the presence than in the absence of reward. A similar pattern appeared when intrinsic motivation was the known cause and extrinsic reward was the inferred event. Youngest children believed that a parent is more likely to promise a reward, while the oldest children believed that the parent is less likely to promise a reward, when intrinsic interest in an activity is high than when it is low. This result seems to bolster the conclusion that young children's deduction of greater intrinsic motivation from greater rewards is not a methodological artifact but is an instance of the general tenet that in the context of play "good things go together". These developmental changes were statistically supported by a significant Age x Cause interaction in the drawing theme data ($F(1,34)=4.16$, $p<.02$), showing that the youngest group used augmentation ($p<.06$), the middle group did not use any rule systematically, and the oldest

group used discounting ($p<.01$).

Functional measurement analysis revealed that simple addition and subtraction operations characterized the augmentation and discounting rules respectively. These linear integration rules were indicated by significant main effects and nonsignificant interaction between the two stimulus factors - known cause and behavioral intensity (Cause and Behavior main effects were respectively: $F(1,18)$= 3.90, 14,40 for six year olds, and $F(1,13)$=7.37, 56.60 for ten year olds).

Figure 1 further shows that, in contrast to qualitative changes in play attributions, the attribution of the non-play behaviors sampled in the present study did not change with development. A composite 3(Age) x 2(Sex) x 2(Locus) x 2(Cause) x 2 (Behavior) x 6(Theme) ANOVA that treated theme as a between-factor, adding only conservative bias, yielded a significant Cause x Theme interaction ($F(5,210)$=12.3, $p<.001$) and a marginally significant Age x Cause x Theme interaction ($F(2,210)$=2.19, $p<.10$). These interactions show that the augmentation rule was used only for play attributions, and mostly by the youngest children; the discounting rule was used for attribution of the non-play behaviors. When the play theme was excluded from the analysis, there was clear evidence for discounting even among the youngest children ($F(1,98)$=14.13, $p<.001$). No significant effects were associated with Sex or Causal Locus.

In conclusion, the present research demonstrates that since young children could use discounting within the present methodology and yet chose to use augmentation instead when inferring intrinsic motivation, they must have a strong bias to believe that external rewards add to, rather than detract from, the intrinsic value of an activity. These findings seriously challenge the attributional account of the undermining effect of rewards on intrinsic motivation. The present work has two general implications for the study of human motivation. It reminds motivation theorists that cognitive formulations of human motivation

must take into consideration the level of cognitive organization of the individual. At the same time, it alerts developmentalists to the possibility that if cognition influences motivation then, contrary to the traditional S-R view of motivational development, qualitatively different laws of motivation may be operating at different stages of mental development.

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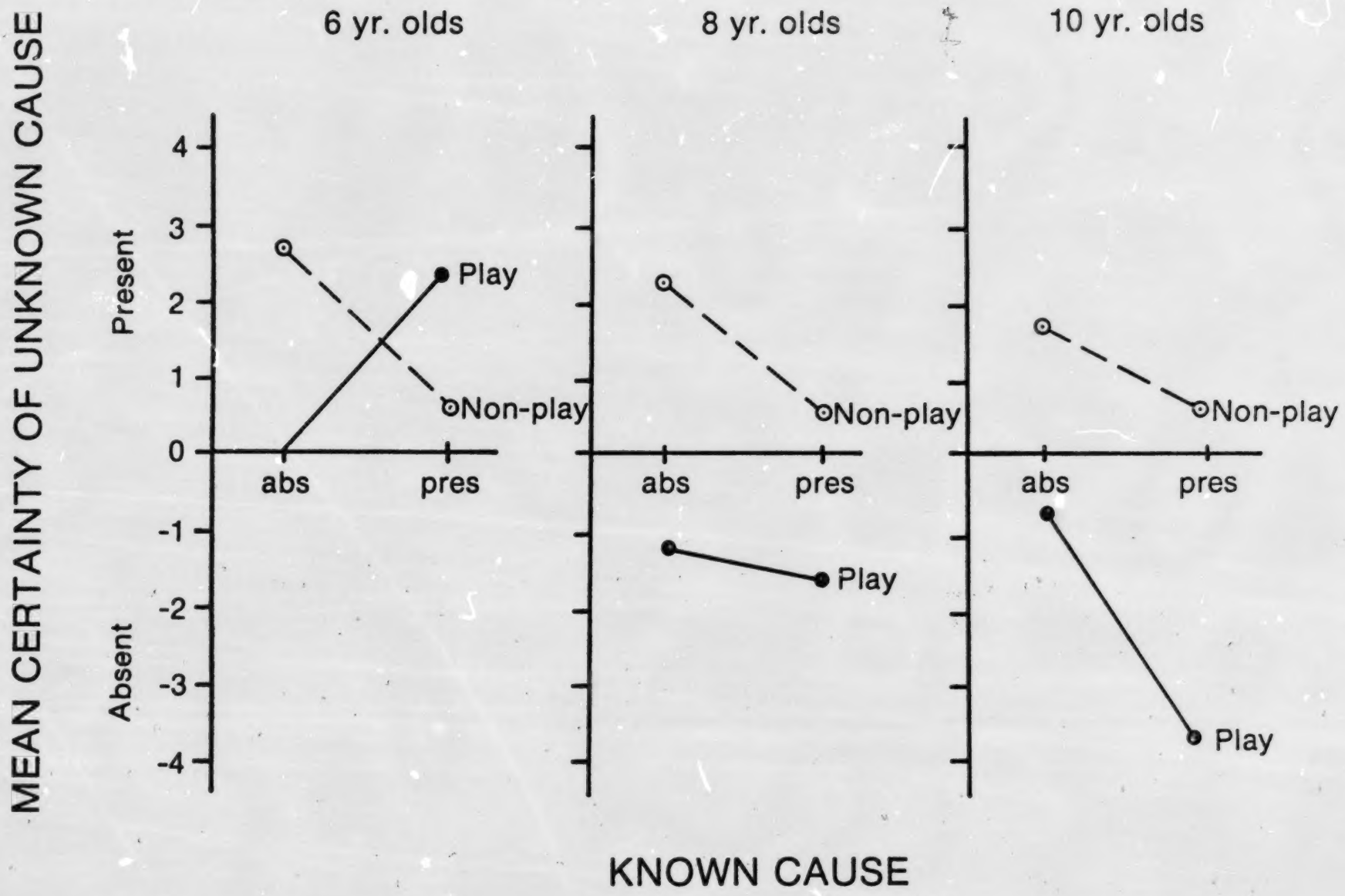
Figure Caption

Figure 1. Mean certainty of state of unknown case as a function of state of known cause, age, and type of behavioral effect.


6 yr. olds
8 yr. olds
10 yr. olds
MEAN CERTAINTY OF UNKNOWN CAUSE
Present
Absent
4
3
2
1
0
-1
-2
-3
-4
Play
Non-play
abs
pres
KNOWN CAUSE